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Editorial

Early Childhood Mathematics Education Research: A Powerful Beginning

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There has been a great deal of research in recent years in the field of mathematics in the early childhood years[1], especially in the early years of school. Much of this research and associated implementation of programs has had its genesis in Australia and New Zealand, especially in the area of early number. As well, Australasian early childhood mathematics educators and researchers have adapted much of the recent general early childhood research involving early brain development, play, argumentation and investigation, reflection and recording to demonstrate the power of young children's mathematical thinking and how this thinking affects children's learning in the early years.

Our aim in this issue of MERJ is to highlight and celebrate some of the significant early childhood mathematics education research which has taken place in recent years and continues to take place in Australia, New Zealand, and elsewhere. All of the papers in this Special Issue have been written by MERGA members and all have important statements to make about Australasian mathematics education.

One of the concerns that we had in developing this issue was whether we would be able to attract sufficient quality papers. Hence, we took two approaches to procuring papers. Firstly, we invited a small number of recognised early childhood mathematics education researchers—some from Australasia and some from beyond—to develop expressions of interest. Secondly, through the MERGA newsletter, we made a general call for expressions of interest. Much to our delight, these two approaches netted 18 expressions of interest!

Following careful evaluation of the expressions of interest, we determined that seven author teams should be invited to submit a paper, and that four other teams who had made submissions dealing with aspects of systemic numeracy programs should be invited to combine to produce one paper. Much to the credit of all the author teams, we received eight papers for review.

The review process involved 26 reviewers, including 8 members of the MERJ Editorial Board, 11 reviewers from Australasia and another 7 from further afield. Each paper was reviewed by an Editorial Board member and

[1] We have used the internationally accepted definition that the early childhood years range from birth to 8 years.

at least two other reviewers. As a result of the review process, five papers were accepted for the Special Issue, with two others being considered for later issues of MERJ. These five papers represent a wide variety of topics in early childhood mathematics education research and approaches to researching these topics.

The first paper by Anderson, Anderson and Shapiro continues the extensive work of this team around the important links between mathematics and literature. It reports a study that explores the attention given by 4-year-old children and their parents as they read two popular children's books and provides great stimulus for teachers and other researchers to pursue similar projects in their own contexts. While this study was completed in Canada, it has much resonance with the work of many Australasian mathematics education researchers in the intersection of literacy and mathematics and recalls some of the strong contributions to this field that resulted from the early work of many MERGA members.

One of the features of the early childhood mathematics education research landscape in Australia and New Zealand over the last ten or more years has been the development and implementation of systemic numeracy programs, with professional development of teachers as a major component. Following the initial call for expressions of interest for this Special Issue, four proposals were received from the key researchers involved with these programs in New South Wales, Victoria and New Zealand. As guest editors of the issue, we set the challenge to all four proposers that they combine their efforts and produce a comparative paper detailing the achievements of each program. This was not a simple request but all involved have worked towards an admirable outcome: the Bobis, Clarke, Clarke, Thomas, Wright, Young-Loveridge, and Gould paper. This contribution to the Special Issue describes the programs and provides ample evidence for the success of each in its own particular context. As well, it traces the research sources for the programs and compares the ways in which each program has developed from these roots.

The English and Watters paper explores the interactions between a group of 8-year old children and two innovative modelling problems. It challenges early childhood mathematics education researchers to consider what mathematics might be appropriate for young children and how this mathematics might be introduced and elaborated. It also highlights the extent of mathematical power that can be seen in classes in the early years of school, provided that the situations into which the children are placed by the teacher are open and supportive enough to allow the children to run with their own ideas and investigations. While mathematical modelling has been explored extensively with older children, work in the early childhood years has been scant. This paper should be seen as one that is actively pushing the envelope and investigating this important mathematical idea with younger children, thereby seeking an answer to its appropriateness in the early years of school curriculum.

The paper by Wood and Frid explores the effects of a particular organisation of classes in the early years of school on mathematics learning outcomes. In particular, it investigates the numeracy practices of both students and teachers in multiage settings. This paper is significant because of the multiplicity of data collection approaches and the innovative use of discourse analysis and a social interactions coding system, as well as for the reinforcement it provides for the recognition of the teacher as fundamental in the facilitation of learning. These authors present an exemplar on the handling of large amounts of data of many types.

One common aspect of the three systemic numeracy programs described in the Bobis et al. paper is the important part in assessment played by individual one-on-one interviews. In the final paper in this Special Issue, Doig reports on another approach to assessment in the early years. He describes the development of two group-based, written response assessment tools for mathematics for use in prior-to-school and first years of school groups. These tools have been trialled and implemented in various contexts and have been found to provide valid and reliable data which can be used in constructing both formative and summative reports of achievement. The paper provides an important model to other researchers who are developing instruments for use with groups of young children, as well as highlighting the particular powers of the two instruments introduced.

The Special Issue is completed with a review of three Australian mathematics teacher education books. In this review, Outhred explores the relevance and usefulness of these books to beginning teachers and teacher education students at the early childhood level. As guest editors, we set the task of specifically considering the aspects of the books that were particularly relevant to early childhood teachers and making a comparison between them. This was not an easy task but has been achieved with great skill and diplomacy.

It is always tempting to try to discern an overall theme among papers in a Special Issue such as this. However, beyond the somewhat trite commonality of the age of the children involved each of the papers, this collection of papers is probably more significant because of its variety. Methodologies range across the quantitative to qualitative spectrum, settings vary from the home to multiage school classrooms, assessment approaches can be individual interviews through to group-administered tests and there is a range of mathematical topics covered. Then, this variety leads us to think that what is common in all of the papers is a celebration of the mathematical potential in young children and in their activities. All of the authors have recognised that young children have many mathematical skills and much mathematical knowledge and that these can be nurtured by skilful and knowledgeable teachers. The importance of this link between such teachers and young children is certainly an important commonality throughout the Special Issue.

Any Special Issue such as this is the result of the work and cooperation of many people and we are very pleased to be able to thank those who have contributed to this effort. Firstly, we must thank all of the authors who contributed expressions of interest, papers and the book review. In our busy lives, it is not easy to meet deadlines and to respond to specific and detailed requests from editors in quick time. Our authors have managed to do this with great spirit and goodwill. Secondly, the issue would not have reached the quality it has without the work of the reviewers. We have relied on the comments of these reviewers in the synthesis provided for each author and thank them most heartily for their clarity, critique, compassion and punctuality. Finally, two important members of the MERGA Executive have been critical for us in the development of this Special Issue. Helen Forgasz, MERJ Editor, has provided excellent mentoring, even though she is only new in the position herself, and Gloria Stillman, Vice-President (Publications) has been of significant support whenever needed.

We trust that this Special Issue of the *Mathematics Education Research Journal* further strengthens the reputation of the journal and provides a resource that will be useful to early childhood mathematics education researchers. Moreover, we hope that it helps to recognise and celebrate the strength of early childhood mathematics education research in Australasia and beyond and provides an ongoing stimulus to researchers to continue to develop the mathematical power of our young children and their educators and to share these experiences with others.